FEDERAL AID
ANNUAL RESEARCH PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

PROJECT TITLE: Analysis of nitrogen budget in moose.

PRINCIPAL INVESTIGATOR: William B. Collins

COOPERATORS:

FEDERAL AID GRANT PROGRAM: Wildlife Restoration

GRANT AND SEGMENT NR: W-33-2

PROJECT NR: 1.59

WORK LOCATION: Units 13 and 20

STATE: Alaska

PERIOD: 1 July 2003 – 30 June 2004

I. PROGRESS ON PROJECT OBJECTIVES SINCE PROJECT INCEPTION

OBJECTIVE 1: Determine nitrogen availability in major forages of moose in ranges of varying productivity.

We have begun collecting and analyzing moose forages in the Nelchina Basin, Denali National Park, and Togiak National Wildlife Refuge.

OBJECTIVE 2: Quantify diets of moose and determine daily intake of digestible nitrogen during summer and winter.

We constructed foraging paddocks in the Nelchina Basin where moose will be held during foraging trials. We raised and trained 4 moose to halter for the purpose of free-ranging the animals during actual data collection.

OBJECTIVE 3: Determine nitrogen requirements of moose through balance trials.

We built digestion balance stalls for determining the nitrogen digestibility of common moose foods relative to tannin concentrations. We collected the forages to be fed in those trials and raised and trained the moose to be used in those trials.

OBJECTIVE 4: Determine appropriate assay for assessing effects of tannins on protein digestibility in moose.

We have validated that using an automated solvent extractor (ASE) is a legitimate way of extracting tannins for subsequent protein precipitation tests, finding a strong relationship (R-squared = 0.93) between the ASE method and the standard cold methanol method of extraction. We have also begun testing a micro technique for tannin binding analysis that will save much time and money for running the large volume of samples we are collecting. So far, we have found a relationship between the micro technique and standard tannin analysis of R-squared = 0.92. We have also made a good start on building a library of standard phenolics on a HPLC/Mass Spec that will enable us to rapidly identify individual phenolics and their relative importance for precipitating tannins. Essentially, we are now poised for mass processing of samples for tannin-binding analysis.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB 1: Moose forage nitrogen and protein binding capacities of moose forages.

We have begun monitoring the seasonal nutrient and tannin concentrations of principal moose forages in the Nelchina Basin, Denali National Park, and Togiak Wildlife Refuge.

JOB 2A: Forage selection and food habits by tractable moose in Nelchina Basin.

We constructed foraging paddocks in the Nelchina Basin where moose will be held during foraging trials. We raised and trained 4 moose to halter for the purpose of free-ranging the animals during actual data collection. Field trials were delayed by concerns over disease transmission, but these matters have been resolved recently.

JOB 2B: Moose diet based on fecal microhistological and alkane analysis.

No work has been done on this job.

JOB 3: Nitrogen balance trials and determining the digestibility of nitrogen by moose in presence of forage tannins.

We have built digestion balance stalls where we will begin determining the nitrogen digestibility of common moose foods relative to tannin concentrations. We have collected the forages to be fed in those trials and have raised and trained the moose to be used in those trials.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

IV. PUBLICATIONS

V. RECOMMENDATIONS FOR THIS PROJECT

VI. APPENDIX

VII. PROJECT COSTS FOR THIS SEGMENT PERIOD

FEDERAL AID SHARE $ 51,200 STATE SHARE $ 17,100 = TOTAL $68,200

VIII. PREPARED BY:

William B. Collins
Wildlife Biologist III

SUBMITTED BY:

Earl Becker
Research Coordinator

APPROVED BY:

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Thomas W. Paul
Federal Aid Coordinator
Division of Wildlife Conservation

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Matthew H. Robus, Director
Division of Wildlife Conservation

APPROVAL DATE: _____